

DISTRIBUTION AND STATUS OF *ASTRAGALUS TENNESSEENSIS* (FABACEAE) IN ALABAMA

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ABSTRACT

Astragalus tennesseensis Gray ex Chapman (Fabaceae) is a cedar glade endemic that was first collected in Alabama by Professor Thomas P. Hatch in the 1850s. Evidence is presented that suggests his specimen was collected in Colbert County rather than in Lauderdale County, Alabama. The historic distribution of *A. tennesseensis* in Alabama was confined primarily to the Moulton Valley of the Interior Low Plateau. Recent field surveys have documented seven extant populations of this species in Alabama. Without protection, these populations likely will decline, and the species possibly could be extirpated from the southern portion of its historic range.

INTRODUCTION

The perennial legume *Astragalus tennesseensis* Gray ex Chapman (Tennessee milk vetch) is a cedar glade endemic (Baskin and Baskin 1986) whose historic range extended from northern Illinois and east central Indiana south to middle Tennessee and northern Alabama (Barneby 1964, Baskin et al. 1972, Isely 1986). With the exception of a single extant population that occurs on a gravel hill prairie in Tazewell County, Illinois (McFall 1984), *A. tennesseensis* apparently has been extirpated from the northern portion of its range (Baskin and Baskin 1986). It recently has been reintroduced at Wea Gravel Prairie, Tippecanoe County, Indiana (Bowles 1988, LeBlanc 1988), at the only site in that state where it has ever been collected (Hauser et al. 1981). Although most abundant in cedar glade communities in middle Tennessee (Baskin et al. 1972, Kral 1983, Somers and Shea 1990), *A. tennesseensis* is reported from a few localities in glade habitats in northern Alabama (Mohr 1901, Barneby 1964, Baskin et al. 1968, 1972, Kral 1983, Baskin and Baskin 1986, Isely 1986). The species is listed as threatened in Alabama (Freeman et al. 1979a, 1979b), endangered in Tennessee (Somers 1989) and Illinois (Sheviak 1981), and extirpated in Indiana (Bacone and Hedge 1980). It is currently under review by the U.S. Fish and Wildlife Service for possible listing as an endangered or threatened species [FR 55 (35):6184-6229, 21 Feb 1990].

The purpose of this paper is to document the known distribution and status of *A. tennesseensis* in Alabama based on field surveys, conducted by the authors in 1989, 1990, and 1991, on the floristics of cedar glades in Colbert, Franklin, Lawrence, Morgan, Marshall, and Jackson counties. In addition, old reports of *A. tennesseensis* in Alabama have been reviewed in an attempt to accurately determine the historical distribution of the species in the state and to clarify collection localities mentioned in these reports.

THE HATCH COLLECTION

The first known collection of *A. tennesseensis* from Alabama was made by Professor Thomas P. Hatch in the 1850s. Hatch was a member of the faculty at LaGrange College (McGregor, no date, Sheridan 1980), which was the first chartered college in Alabama. The site of the original LaGrange College was the small village of LaGrange located about five km southwest of the town of Leighton in what is now Colbert County, Alabama (Fig. 1). The site of LaGrange was unknown to Barneby (1964) who commented that the location where Professor Hatch collected *A. tennesseensis* "...has not been identified...."

Mohr (1901) and Barneby (1964) list Lauderdale County as the locality for the Hatch collection. The basis for assuming that Hatch's *Astragalus* collection was from Lauderdale County likely resulted from an article published by Hatch (1856) entitled "Floral Calendar, for part of 1855, in Lauderdale County, Alabama"; by Thos. P. Hatch, Professor of Natural Science in La Grange College, Florence, Alabama. In this article, Hatch includes an *Astragalus* that he considered to be an undescribed species.

While the original LaGrange College was located in what is now Colbert County, the entire faculty, with the exception of a single member, moved to Florence, Alabama, in January 1855. The college in Florence was for a brief time called LaGrange College, but it failed to receive a charter under the original name and became known as Florence Wesleyan University (now the University of North Alabama). The LaGrange College near Leighton acquired a new faculty and reopened. The buildings of LaGrange College were burned in 1863 by the Union army, and the college was never rebuilt (McGregor undated, Sheridan 1980).

A specimen of *Astragalus* collected by Hatch was sent to Professor Asa Gray at Harvard University. The specimen was used by Gray in describing *A. tennesseensis* and is cited by Barneby (1964) as a paratype. The Hatch specimen is contained in the collections of the Gray Herbarium (GH!) and is mounted on the same sheet as the holotype for *A. tennesseensis* that was collected by Lesquereux near Nashville, Tennessee. A neatly clipped fragment of a letter from Professor Hatch to Asa Gray is contained within a packet on the herbarium sheet. The original letter apparently contained notes on several different species, and the section

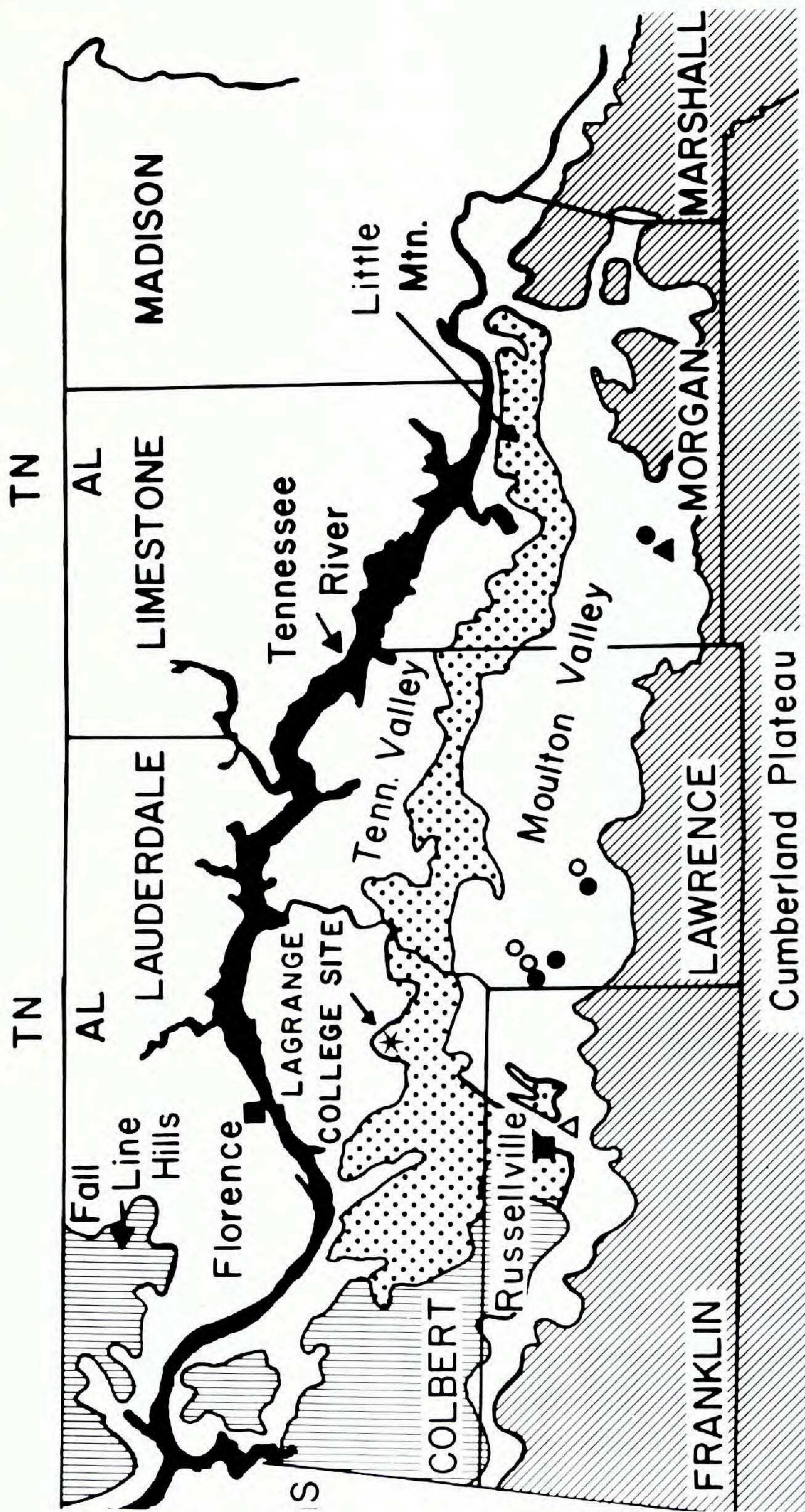


Fig. 1. Distribution of *Astragalus tennesseensis* in northern Alabama: populations of 50 – 150 plants (○); populations of less than 50 plants (●); approximate locality for Mohr collection (△); and recently extirpated population (▲). Generalized physiographic map is modified from Harper (1942) and Sapp and Emplaincourt (1975).

pertaining to *Astragalus* was cut out and placed with specimen. One side of the fragment includes the heading and salutation that identifies the letter as being sent to Gray from LaGrange, Alabama, on May 5, 1854. The reverse side contains the following information relating to the *Astragalus* specimen:

I have met with in but two localities during five years of botanical observation a single bed of it in Sumner County, Tennessee, & a single plant in this vicinity. It appears to be an *Astragalus* but the stipules being adnate to the petiole, its smooth pericarp and the cales of its flowers separate it from everything under that genus. It is always prostrate or at most assurgens & never much exceeds this in height.

From the letter fragment, it appears that the specimen was collected and mailed prior to the move of LaGrange College to Florence in 1855. Apparently, *A. tennesseensis* also was rare in the vicinity of LaGrange since Hatch had seen only a single plant. The 1854 date on the herbarium sheet, referring to the Hatch specimen, apparently was altered to 1855, causing further confusion.

While the exact locality where the Hatch specimen was collected likely will never be determined, it seems logical that it was from the vicinity of the LaGrange College site in Colbert County, Alabama. Extensive glades occur about 15 km south of the LaGrange site in Franklin and Lawrence counties, and a small glade complex with several cedar glade endemics, including *Lesquerella lyrata* Rollins (Webb and Kral 1984), occurs within 5 km of the old LaGrange College site in Colbert County. The cedar glade community of which *A. tennesseensis* is typically a component is not known to occur in Lauderdale County. Hatch (1856) also included *Leavenworthia aurea* Torrey in his floral calendar of Lauderdale County. This collection probably was *L. alabamica* Rollins, which is abundant in glades south of the Tennessee River but is not reported by Rollins (1963) from Lauderdale County on the north side of the Tennessee River. Harper (1928) also notes that Hatch's floral calendar related "...to the vicinity of LaGrange College, which was on Little Mountain, in what is now Colbert County." Thus, it is probable that the plant list and floral calendar of Hatch included a wider geographic area than the title would imply.

DISTRIBUTION

Field surveys by the authors have documented seven extant populations and one recently extirpated population of *A. tennesseensis* in Lawrence and Morgan counties (Fig. 1). The populations are within a subdivision of the Interior Low Plateau Physiographic Province (Fenneman 1938) referred to by Harper (1942) and earlier authors as the Moulton Valley. The Moulton Valley contains outcroppings of Bangor limestone of Mississippian age, and in Alabama extends from the Alabama/Mississippi state line (Franklin County) eastward through Lawrence and Morgan counties into extreme western Marshall County (Harper 1942).

A specimen of *A. tennesseensis* from the Mohr Herbarium (UNA!) that presumably was collected in the late 1800s. extends the historical distribution to the western portion of the Moulton Valley near Russellville. The herbarium label on the specimen describes the collection locality as "Shaded limestone rocks in Russel valley. Locust Dell near Russellville." The "Locust Dell" cited by Mohr has not been relocated, and no extant populations of *A. tennesseensis* have been found in the vicinity of Russellville. However, glade habitat occurs in the area, and other cedar glade endemics including *Delphinium alabamicum* Kral, *Pedimelum subacaule* (Torrey & Gray) Rydberg, *Onosmodium molle* Mich. subsp. *molle*, *Oxalis priceae* Small subsp. *priceae*, *Dalea gattingeri* (Heller) Barneby, and *Leavenworthia alabamica* Rollins var. *alabamica* are known from sites near Russellville.

Historical and recent collections indicate the historical distribution of *A. tennesseensis* in Alabama largely was confined to the Moulton Valley in Franklin, Lawrence, and Morgan counties. A possible exception is the Hatch specimen that apparently was collected in the vicinity of the old LaGrange College site in Colbert County, not in Lauderdale County as cited by Mohr (1901) and Barneby (1964). The nearest known glades to LaGrange College are in the Tennessee Valley portion of the Interior Low Plateau.

POPULATION STATUS

Four of the seven known extant populations of *A. tennesseensis* in northern Alabama consist of less than fifty plants each (Fig. 1). Three of these occur primarily along road right-of-ways, and thus could be extirpated or significantly reduced if the roads are widened. One of the roadside populations was sprayed with herbicide in 1991. The fourth population, consisting of two plants, inhabits a small glade opening in cedar woods and could disappear in the near future due to natural succession. The other three populations are much larger, and each consists of an estimated 50 to 150 individuals. At the present time, land use at these three sites does not pose an immediate threat to *Astragalus* populations. One small population of *A. tennesseensis* in Morgan County (Fig. 1) with three plants in 1989 was not observed during a field survey in 1991 and appears to have been extirpated.

All of the known populations of *A. tennesseensis* in Alabama are on privately owned lands or road right-of-ways. Dumping of trash, road improvement and road maintenance, construction of fences, grazing, development, and conversion of land to forage crops are threats to existing populations. Further, individuals of *A. tennesseensis* are short-lived, and thus plants must often become established from seeds if populations are to persist (Baskin and Baskin 1989). Unless protective measures are instituted, populations of the Tennessee milk vetch likely will decline in Alabama and possibly be extirpated from the southern portion of its historic range.

VOUCHER SPECIMENS

Voucher specimens for seven of the populations cited in this paper have been deposited at VDB as follows: **Lawrence Co.:** *Webb* 5518, 5554, 5570, 5752, 5764. **Morgan Co.:** *Webb, Baskin & Baskin* 5487, 5488, 5490.

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